

## REMARKS

Claims 7-13 and 15-25 are pending in the application. Claims 7-13 and 15-25 are rejected. No claims are amended with this reply.

### Reply to the Rejection of Claims 7-13 and 15-25 under 35 U.S.C. § 103(a)

The Examiner has rejected Claims 7-13 and 15-25 as being obvious in view of U.S. Patent No. 5,385,959 to Tsaur *et al.* ("Tsaur"). Specifically, the Examiner states –

Tsaur discloses a composite polymer comprising a hydrophobic polymer core particle and a hydrophilic polymer attached to the hydrophobic core via formation of high grafted composite particles, column 3, lines 56-63 and column 10, lines 27-67. The core/shell structure of the high grafted composite particles is readable in applicants' claimed graft copolymer. The monomer or mixture of monomers used for forming the hydrophobic core particles of the composite polymer includes any emulsion polymerizable monomer that contains ethylenically unsaturated group such as styrene, vinylacetate, (meth)acrylamide, column 12, lines 4-11. The hydrophobic monomer such as styrene is readable in applicants' claimed hydrocarbons for forming a hydrophobic backbone segment, for the present claims. The hydrophilic polymer includes water soluble polymers such as polyvinyl alcohol and its copolymers with vinyl acetate; polyvinyl pyrrolidone and its copolymers with styrene and vinyl acetate; and polyacrylamide and its various modification, column 10, lines 64-68, column 11, lines 26-30. The hydrophobic moiety can include butylenes oxide and/or propylene oxide, column 19, lines 12-13. The monomer units comprising both the hydrophilic backbone and hydrophobic side chain may be substituted with groups such as amino, amine and amide, column 19, lines 27-28, for the present claims. Therefore, a hydrophobic core can include functional group such as amine or amide for the present claim 7. The ratio of hydrophobic polymer core to hydrophilic water-soluble polymer can be in the range of 2:8, column 12, lines 17-18, for the present claim 11. The composition contains one or more surface active agents such as surfactant(s), column 4, lines 33-40. A triethoxy C12 to C15 alcohol sulfate having the formula at column 5, lines 45-57 and column 8, lines 36-47 is also readable in applicants' claimed non-polymeric surfactant in claim 21. The selection of non-polymeric surfactant as being a hydrophobic backbone for making a graft copolymer is not clear in the present claim 21. However, surfactants in Tsaur's invention are readable in the present claims 21 and 24. The pH level of the liquid detergent can be in the range from 6 to 10, column 20, line 2. The desired pH level that is triggerable in the present claim is readable in Tsaur since desirable pH can be obtained by adding monoethanolamine/triethanolamine buffer system, column 20, lines 22-27.

It would have been obvious to one of ordinary skill in the art to use a composite polymer having a hydrophobic polymer core and a hydrophilic shell in Tsaor wherein hydrophobic moieties and hydrophilic moieties are selected such that a hydrophobic moiety for forming a backbone includes at least one hydrocarbon unit such as styrene and a hydrophilic moiety includes polyacrylamide.

For the following reasons, Applicants respectfully traverse the Examiner's rejection of claims 7-13 and 15-25 as being obvious in view of Tsaor.

Referring to Tsaor, therein is disclosed a capsule for use in heavy-duty liquid ('HDL') compositions having a degradable component and a composite polymer. The degradable component contained within the capsule can be enzymes (col. 14, line 65 - col. 16, line 68). In addition to the capsule, ingredients found in the liquid detergent include surfactants and electrolytes (col. 4, line 27 - col. 10, line 27). Other optional ingredients can be included in the HDL, such as clays, adjuvants, brighteners, biocides, softeners and deflocculating polymers (col. 17, line 1 - col. 19, line 52).

The composite polymer of the capsule can be prepared by emulsion polymerization of the core hydrophobic monomer in the presence of one or more water soluble polymers (col. 10, lines 27-33). The one or more monomers used in forming the hydrophobic core particle include any emulsion polymerizable monomer that contains an ethylenically unsaturated group. Examples of such monomers include styrene,  $\alpha$ -methyl styrene, divinyl benzene, vinyl acetate, acrylamide or methacrylamide and their derivatives; acrylic acid or methacrylic acid and their ester derivatives such as butyl acrylate or methyl methacrylate (col. 12, lines 4-14). Tsaor emphasizes that the monomers used in forming the hydrophobic core particle are emulsion polymerizable monomers, not hydrophobic polymers (col. 12, lines 15-16).

Two broad types of hydrophilic polymers are suitable for use in the composite polymer (col. 10, lines 50-51). The first type is nonionic water soluble polymers that display an upper consolute temperature or cloud point (col. 10, lines 52-53). These include synthetic polymers such as polyvinyl alcohol and its copolymers with vinyl acetate; polyvinyl pyrrolidone and its various copolymers with styrene and vinyl acetate; and polyacrylamide and its various modifications (col. 10, lines 63-68). Also useful are natural modified polymers such as partially hydrolyzed cellulose acetate, hydroxy ethyl, hydroxy propyl and hydroxy butyl cellulose, methylcellulose and so forth (col. 11, lines 3-6).

The second type of useful hydrophilic polymers are those having functional. Groups that can form labile chemical or ionic crosslinks, *i.e.*, crosslinks that are reversible and breakdown under dilution, with an optional crosslinking agent (col. 11, lines 12-18). Examples of such polymers include polyvinyl alcohol and its copolymers with vinyl acetate; certain polysaccharides such as hydroxy ethyl cellulose and methylcellulose; various proteins such as tannic acid, trichloroacetic acid and ammonium sulfate; and polymers like carboxyl bearing charged groups, *e.g.*, acrylic polymers and maleic acid containing polymers (col. 11, lines 26-44).

As discussed above, the HDL can include other optional ingredients such as deflocculating polymers in addition to the degradative components and the composite polymer that make up the capsule (col. 17, lines 1-4 and col. 18, lines 18-20). This deflocculating polymer has a hydrophilic backbone and one or more hydrophobic side chains (col. 18, lines 21-23 and 30). The Examiner cites Tsaur as teaching that the hydrophobic backbone moiety can include butylene oxide and/or propylene oxide, and that monomer units comprising both the hydrophilic backbone and hydrophobic side chain can be substituted with amine and amide groups. However, this refers to the deflocculating polymer, and not the composite polymer used in forming the capsule. The deflocculating polymer does not have a hydrophobic backbone. More particularly, the deflocculating polymer does not have a hydrophobic backbone that is selected from natural polymers, linear hydrocarbons, branched hydrocarbons and non-polymeric surfactants.

The Examiner further refers to Tsaur as teaching that the 'composition' contains one or more surfactants. As shown above, this 'composition' is the HDL, and not the composite polymer capsule, *i.e.*, the liquid detergent has both composite polymer capsules and surfactants therein. Tsaur does not teach or suggest a graft copolymer having a hydrophobic backbone moiety that can be a non-polymeric surfactant. Further, Tsaur does not teach or suggest a non-polymeric surfactant that is the hydrophobic backbone of a graft copolymer and has an amide or amine moiety grafted thereon.

Regarding pH, Tsaur merely teaches that its HDL is stable at a pH of 5 to 12.5 (col. 19, line 53 – col. 20, line 2). The pH of the HDL can be varied if desired by modifying the buffering system (col. 20, lines 22-29). Tsaur does not teach or suggest a capsule that is solubilized or

triggerable by changing the pH of the solution that it is contained in (*see*, Example 6, col. 25 line 62 – col. 26, line 14).

For at least all of the above reasons, it is seen that Tsaur does not teach or suggest the graft copolymers of the present invention. It is believed that these remarks overcome the Examiner's rejection of claims 7-13 and 15-25 as being obvious in view of Tsaur under 35 U.S.C. § 103(a). Withdrawal of the rejection is respectfully requested.

Based on the above amendments and remarks, allowance of the claims is believed to be in order, and such allowance is respectfully requested.

Respectfully submitted,

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